AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for computing payment discounts awarded to a plurality of winning agents in an exchange, said method comprising:

computing a Vickrey discount to said plurality of winning agents in a cleared exchange as the difference between available surplus with all agents present minus available surplus without said plurality of winning agents, wherein the available surplus is a difference between an asked for payment from sellers and a bid payment from buyers, and wherein the winning agents are sellers and buyers are matched to one another; and

computing said payment discounts by adjusting said Vickrey discounts so as to constrain said exchange to budget-balance.

2. (Previously Presented) The method of claim 1 wherein said adjusting step further comprises:

minimizing a distance function under said budget-balance constraint and one or more bounding constraints, said distance function comprising a metric of the distance between said payment discounts and said Vickrey discounts;

deriving a parameterized payment rule for said distance function;

determining an allowable range of parameters so as to maintain budget-balance; and

selecting values for said parameters within said allowable range.

3. (Original) The method of claim 2 wherein said values for said parameters are selected within said allowable range so as to minimize agent manipulation.

4. (Original) The method of claim 2 wherein said bounding constraints comprises a constraint that said payment discounts be non-negative.

5. (Original) The method of claim 2 wherein said bounding constraints comprises a constraint that said payment discounts not exceed said Vickrey discounts.

6. (Previously Presented) The method of claim 2 wherein said distance function is one of:

$$L_2(\Delta,\Delta^V) = \left(\Sigma_l\left(\Delta_l^V - \Delta_l\right)^2\right)^{1/2},$$

$$L_\infty(\Delta,\Delta^V) = \max_l\left|\Delta_l^V - \Delta_l\right|,$$

$$L_{RE}(\Delta,\Delta^V) = \Sigma_l\left(\Delta_l^V - \Delta_l\right)/\Delta_l^V,$$

$$L_\pi(\Delta,\Delta^V) = \Pi_l\Delta_l^V/\Delta_l,$$

$$L_{RE2}(\Delta,\Delta^V) = \Sigma_l\left(\Delta_l^V - \Delta_l\right)^2/\Delta_l^V, \quad \text{and}$$

$$L_{RE}(\Delta,\Delta^V) = \Sigma_l\Delta_l^V\left(\Delta_l^V - \Delta_l\right),$$

wherein Δ_l^V is said Vickrey discount for an agent l and Δ_l is a new payment discount for the agent l.

7. (Previously Presented) The method of claim 6, wherein said parameterized payment rule comprises:

a Threshold Rule $\max(0,\Delta_l^V - C)$, $C \geq 0$ if said distance function is $L_2(\Delta,\Delta^V)$ or $L_\infty(\Delta,\Delta^V)$;

a Small Rule Δ_l^V if $\Delta_l^V \leq C$, $C \geq 0$ if said distance function is $L_{RE}(\Delta,\Delta^V)$;

a Reverse Rule $\min(\Delta_l^V,C)$, $C \geq 0$ if said distance function is $L_\pi(\Delta,\Delta^V)$;

a Fractional Rule $\mu\Delta_l^V$, $0 \le \mu \le 1$ if said distance function is $L_{RE2}(\Delta,\Delta^V)$; and

a Large Rule Δ_l^V if $\Delta_l^V \ge C$, $C \ge 0$ if said distance function is $L_{RE}(\Delta,\Delta^V)$,

wherein C is a given parameter.

8. (Currently Amended) A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for computing payment discounts awarded to a plurality of winning agents in an exchange, said method steps comprising:

computing a Vickrey discount to said plurality of winning agents in a cleared exchange as the difference between available surplus with all agents present minus available surplus without said plurality of winning agents, wherein the available surplus is a difference between an asked for payment from sellers and a bid payment from buyers, and wherein the winning agents are sellers and buyers matched to one another; and

computing said payment discounts by adjusting said Vickrey discounts so as to constrain said exchange to budget-balance.

9. (Previously Presented) The program storage device of claim 8 wherein said adjusting step further comprises:

minimizing said distance function under said budget-balance constraint and one or more bounding constraints, said distance function comprising a metric of the distance between said payment discounts and said Vickrey discounts;

deriving a parameterized payment rule for said distance function;

determining an allowable range of parameters so as to maintain budget-balance; and

selecting values for said parameters within said allowable range.

10. (Previously Presented) The program storage device of claim 9 wherein said values for said parameters are selected within said allowable range so as to minimize agent manipulation.

11. (Previously Presented) The program storage device of claim 9 wherein said bounding constraints comprises a constraint that said payment discounts be non-negative.

12. (Previously Presented) The program storage device of claim 9 wherein said bounding constraints comprises a constraint that said payment discounts not exceed said Vickrey discounts.

13. (Previously Presented) The program storage device of claim 9 wherein said distance function is one of:

$$L_2(\Delta,\Delta^V) = \left(\Sigma_l\left(\Delta_l^V - \Delta_l\right)^2\right)^{1/2},$$

$$L_\infty(\Delta,\Delta^V) = \max_l\left|\Delta_l^V - \Delta_l\right|,$$

$$L_{RE}(\Delta,\Delta^V) = \Sigma_l\left(\Delta_l^V - \Delta_l\right)/\Delta_l^V,$$

$$L_\pi(\Delta,\Delta^V) = \Pi_l\Delta_l^V/\Delta_l,$$

$$L_{RE2}(\Delta,\Delta^V) = \Sigma_l\left(\Delta_l^V - \Delta_l\right)^2/\Delta_l^V, \text{ and}$$

$$L_{RE}(\Delta,\Delta^V) = \Sigma_l\Delta_l^V\left(\Delta_l^V - \Delta_l\right),$$

wherein Δ_l^V is said Vickrey discount for an agent l and Δ_l is a new payment discount for the agent l.

14. (Previously Presented) The program storage device of claim 13, wherein said parameterized payment rule comprises:

a Threshold Rule $\max(0, \Delta_l^V - C)$, $C \geq 0$ if said distance function is $L_2(\Delta, \Delta^V)$ or $L_\infty(\Delta, \Delta^V)$;

a Small Rule Δ_l^V if $\Delta_l^V \leq C$, $C \geq 0$ if said distance function is $L_{RE}(\Delta, \Delta^V)$;

a Reverse Rule $\min(\Delta_l^V, C)$, $C \geq 0$ if said distance function is $L_\pi(\Delta, \Delta^V)$;

a Fractional Rule $\mu \Delta_l^V$, $0 \leq \mu \leq 1$ if said distance function is $L_{RE2}(\Delta, \Delta^V)$; and

a Large Rule Δ_l^V if $\Delta_l^V \geq C$, $C \geq 0$ if said distance function is $L_{RE}(\Delta, \Delta^V)$,

wherein C is a given parameter.

15. (Cancelled)

16. (Previously Presented) The method of claim 1, wherein the computation of the Vickrey discount to said plurality of winning agents is performed after the exchange is cleared.

17. (Previously Presented) The program storage device of claim 8, wherein the computation of the Vickrey discount to said plurality of winning agents is performed after the exchange is cleared.